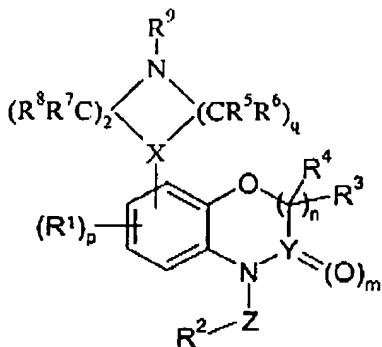


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Claim Listing

1. (Currently Amended) A compound of the formula:



or a pharmaceutically acceptable salt or prodrug thereof,
wherein:

Y is C-~~or~~-S;

~~m is 1 when Y is C and m is 2 when Y is S;~~

n is 1-~~or~~-2;

p is from 0 to 3;

q is from 1 to 3;

Z is -(CR^aR^b)_r, or -SO₂-, where each of R^a and R^b is independently hydrogen or alkyl;

r is from 0 to 2;

X is CH or N;

each R¹ is independently halo, alkyl, haloalkyl, heteroalkyl, alkoxy, cyano, -S(O)_sR^c, -C(=O)-NR^cR^d, -SO₂-NR^cR^d, -N(R^c)-C(=O)-R^d, or -C(=O)R^c, where each of R^c and R^d is independently hydrogen or alkyl;

s is from 0 to 2;

R² is aryl or heteroaryl;

each of R³ and R⁴ is independently hydrogen, alkyl, hydroxyalkyl or alkoxyalkyl, or R³ and R⁴ together with their shared carbon may form a ring of 3 to 6 members that optionally includes a nitrogen or oxygen heteroatom; and

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each of R⁵, R⁶, R⁷, R⁸ and R⁹ is independently hydrogen or alkyl, or one of R⁵ and R⁶ together with one of R⁷, R⁸ and R⁹ and the atoms therebetween may form a ring of 5 to 7 members.

2. (Original) The compound of claim 1, wherein Z is -(CR^aR^b),-.
3. (Original) The compound of claim 2, wherein X is N and q is 2.
4. (Canceled)
5. (Currently Amended) The compound of claim 43, wherein r is 1.
6. (Original) The compound of claim 5, wherein R^a and R^b are hydrogen.
7. (Original) The compound of claim 6, wherein R² is optionally substituted phenyl or optionally substituted naphthyl.
8. (Original) The compound of claim 7, wherein R² is 2-halophenyl, 3-halophenyl, 4-halophenyl, naphthyl-2-yl, 3-cyanophenyl, 4-cyanophenyl, 3-nitrophenyl, 3-aminophenyl, 3-methoxyphenyl, 3-ureaphenyl, or 3-methylsulfonylamino-phenyl.
9. (Original) The compound of claim 7, wherein p is 1 and R¹ is halo, methyl or methoxy.
10. (Original) The compound of claim 7, wherein R³ and R⁴ are hydrogen.
11. (Original) The compound of claim 7, wherein R³ and R⁴ are methyl.
12. (Original) The compound of claim 7, wherein one of R³ and R⁴ is hydrogen and the other is methyl.

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13. (Original) The compound of claim 7, wherein R³ and R⁴ together with the carbon atom therebetween form a cyclobutyl

14. (Currently Amended) The compound of claim 8, wherein said compound is selected from:

4-benzyl-6-methyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-benzyl-6-methoxy-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(2-fluoro-benzyl)-6-methoxy-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(2-chloro-benzyl)-6-methoxy-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(3-chloro-benzyl)-6-methoxy-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-benzyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-benzyl-6-fluoro-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(2-fluoro-benzyl)-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(4-fluoro-benzyl)-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(4-chloro-benzyl)-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(4-fluoro-benzyl)-6-fluoro-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(2-fluoro-benzyl)-6-fluoro-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(2-chloro-benzyl)-6-fluoro-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(4-chloro-benzyl)-6-fluoro-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
6-fluoro-4-naphthalen-2-ylmethyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(3-chloro-benzyl)-6-fluoro-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
3-(3-oxo-8-piperazin-1-yl-2,3-dihydro-benzo[1,4]oxazin-4-ylmethyl)-benzonitrile;
4-(3-fluoro-benzyl)-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-benzyl-2,2-dimethyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
(R)-4-benzyl-2-methyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-benzyl-6-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(4-Fluoro-benzyl)-6-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
(S)-4-Benzyl-2-methyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
8-Piperazin-1-yl-4-pyridin-4-ylmethyl-4H-benzo[1,4]oxazin-3-one;
4-Benzyl-6-methyl-8-(4-methyl-piperazin-1-yl)-4H-benzo[1,4]oxazin-3-one;

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4-Benzyl-8-(4-methyl-piperazin-1-yl)-4H-benzo[1,4]oxazin-3-one;
4-(1-Phenyl-ethyl)-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(3-Methoxy-benzyl)-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(3-Nitro-benzyl)-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(3-Amino-benzyl)-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
3-(3-Oxo-8-piperazin-1-yl-2,3-dihydro-benzo[1,4]oxazin-4-ylmethyl)-benzonitrile;
N-[3-(3-Oxo-8-piperazin-1-yl-2,3-dihydro-benzo[1,4]oxazin-4-ylmethyl)-phenyl]-methanesulfonamide;
4-(4-Fluoro-benzyl)-2,2-dimethyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(3-Fluoro-benzyl)-2,2-dimethyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
[3-(3-Oxo-8-piperazin-1-yl-2,3-dihydro-benzo[1,4]oxazin-4-ylmethyl)-phenyl]-urea;
4-(3-Chloro-benzyl)-2,2-dimethyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-Benzyl-8-(3,5-dimethyl-piperazin-1-yl)-4H-benzo[1,4]oxazin-3-one;
4-(4-Chloro-benzyl)-2,2-dimethyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-Benzyl-6-fluoro-2,2-dimethyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(4-Chloro-benzyl)-6-fluoro-2,2-dimethyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
6-Fluoro-4-(3-fluoro-benzyl)-2,2-dimethyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
6-Fluoro-4-(4-fluoro-benzyl)-2,2-dimethyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-(3-Chloro-benzyl)-6-fluoro-2,2-dimethyl-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one;
4-Benzyl-8-(3,3-dimethyl-piperazin-1-yl)-4H-benzo[1,4]oxazin-3-one;
1-Benzyl-5-piperazin-1-yl-1H-benzo[1,3,4]oxathiazine 2,2-dioxide; and
4-Benzyl-2,2-spiro-cyclobutan-8-piperazin-1-yl-4H-benzo[1,4]oxazin-3-one.

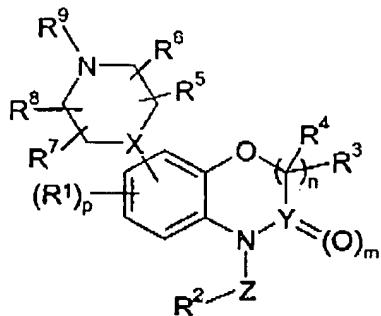
15. (Original) The compound of claim 6, wherein R² is heteroaryl.

16. (Original) The compound of claim 15, wherein R² is pyridine-4-yl.

17-32. (Canceled).

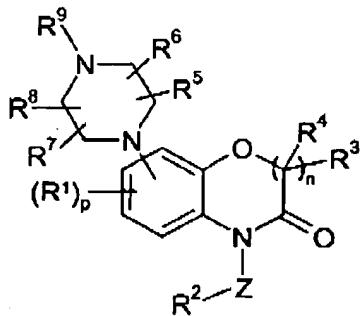
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33. (Original) The compound of claim 1, wherein said compound is of the formula:



or a pharmaceutically acceptable salt or prodrug thereof, wherein X, Y, Z, R¹, R², R³, R⁴, R⁵, R⁶, R⁷, R⁸, R⁹, m, n, and p are as defined in claim 1.

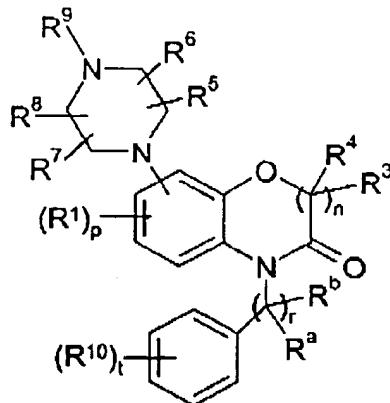
34. (Original) The compound of claim 1, wherein said compound is of the formula:



or a pharmaceutically acceptable salt or prodrug thereof, wherein Z, R¹, R², R³, R⁴, R⁵, R⁶, R⁷, R⁸, R⁹, n, and p are as defined in claim 1.

35. (Original) The compound of claim 1, wherein said compound is of the formula:

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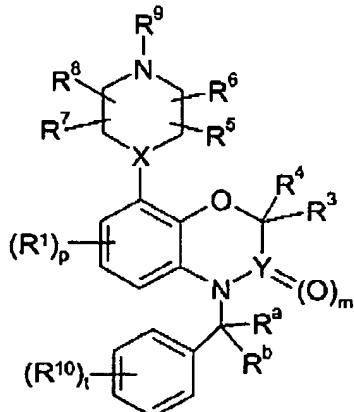


or a pharmaceutically acceptable salt or prodrug thereof, wherein R¹, R³, R⁴, R⁵, R⁶, R⁷, R⁸, R⁹, R¹⁰, n, p and r are as defined in claim 1, and wherein:

t is from 0 to 4; and

each R¹⁰ independently is halo, alkyl, alkoxy or cyano.

36. (Original) The compound of claim 1, wherein said compound is of the formula:



wherein X, Y, R¹, R³, R⁴, R⁵, R⁶, R⁷, R⁸, R⁹, R¹⁰, R^a, R^b, m, p and t are as recited in claim 1.

37. (Original) The compound of claim 36, wherein R¹ is halo, methyl or methoxy.

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38. (Original) The compound of claim 36 wherein R³ and R⁴ each independently is hydrogen or methyl.

39. (Original) The compound of claim 36, wherein R³ and R⁴ together with their shared carbon form a cyclobutyl group.

40. (Original) The compound of claim 36, wherein R⁶, R⁷, R⁸, R⁹ each independently is hydrogen or methyl.

41. (Original) The compound of claim 36, wherein R^a and R^b each independently is hydrogen or methyl.

42. (Original) The compound of claim 36, wherein each R¹⁰ is hydrogen, halo, nitro, cyano, amino, urea, methoxy or methanesulfonylamino.

43. (Original) A pharmaceutical composition comprising an efficacious amount of the compound of claim 1 in admixture with a pharmaceutically acceptable carrier.

44. (Withdrawn) A method for treating a central nervous system disease state in a subject, said method comprising administering to said subject a therapeutically effective amount of a compound of claim 1.

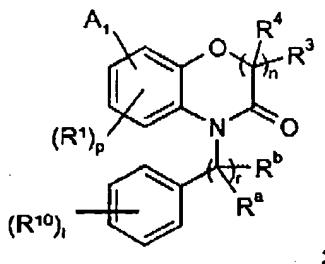
45. (Withdrawn) The method of Claim 44, wherein the disease state is selected from psychoses, schizophrenia, manic depressions, neurological disorders, memory disorders, attention deficit disorder, Parkinson's disease, amyotrophic lateral sclerosis, Alzheimer's disease and Huntington's disease.

46. (Withdrawn) A method for treating a disorder of the gastrointestinal tract in a subject, said method comprising administering to said subject a therapeutically effective amount of a compound of claim 1.

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47. (Currently Amended) A method for producing a substituted benzoxazinone compound, said method comprising:

- (a) contacting an N-arylalkyl benzoxazinone of the formula:



wherein:

A_1 is a leaving group,

n is 1 or 2;

p is from 0 to 3;

r is from 0 to 2;

t is from 0 to 4;

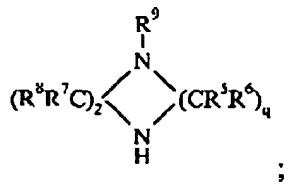
each of R^a and R^b is independently hydrogen or alkyl;

each R^1 is independently halo, alkyl, haloalkyl, heteroalkyl, alkoxy, cyano, $-S(O)_sR^c$, $-C(=O)-NR^eR^d$, $-SO_2-NR^eR^d$, $-N(R^e)-C(=O)-R^d$, or $-C(=O)R^e$, where each of R^e and R^d is independently hydrogen or alkyl and s is from 0 to 2;

each of R^3 and R^4 is independently hydrogen or alkyl; and

each R^{10} is independently halo, alkyl, alkoxy or cyano;

with a heterocyclic compound of the formula:



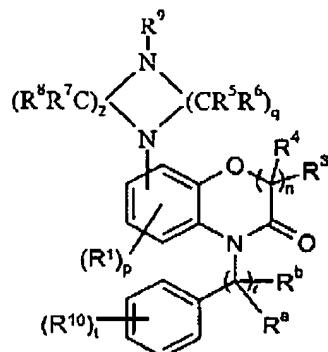
wherein:

q is from 1 to 3; and

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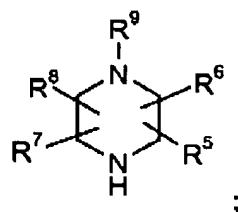
each of R⁵, R⁶, R⁷, R⁸ and R⁹ is independently hydrogen or alkyl, or one of R⁵ and R⁶ together with one of R⁷, R⁸ and R⁹ may form a ring of 5 to 7 members;

in the presence of a palladium catalyst to produce the heterocycl-substituted N-arylalkyl benzoxaninone compound of the formula:



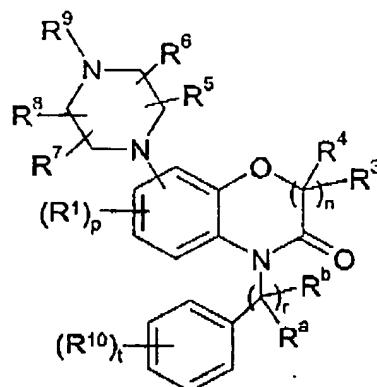
48. (Original) The method of claim 47, wherein the leaving groups A¹ is halo.

49. (Original) The method of claim 47, wherein the heterocyclic compound is of the formula:



such that the heterocycl-substituted N-arylalkyl benzoxaninone compound is of the formula:

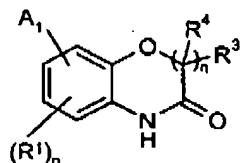
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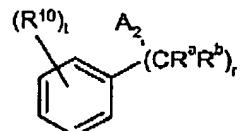
and R¹, R², R³, R⁴, R⁵, R⁶, R⁷, R⁸, R⁹, R¹⁰, n, p, r and t are as described in claim 41.

50. (Original) The method of claim 47, further comprising:

- (a) contacting a benzoxazinone of the formula:



wherein n, p, A₁, R¹, R³ and R⁴ are as described in claim 1,
with an alkylating agent of the formula:



wherein:

A₂ is a leaving group and may be the same or different from A₁; and
t, r, R^a, R^b and R¹⁰ are as described in claim 41;

to produce the N-arylalkyl benzoxazinone of the formula:

